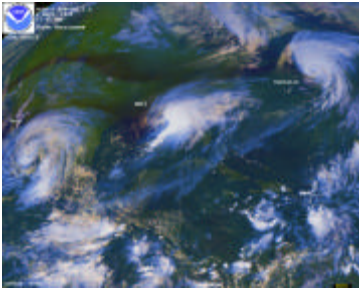
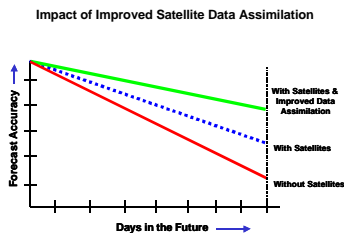


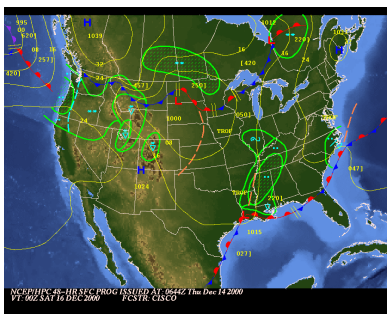
National Environmental Satellite, Data, and Information Service Joint Center for Satellite Data Assimilation



This image from GOES-8 shows three hurricanes off the U.S. Atlantic coast in September 1998.



Impact of Improved Satellite Data Assimilation



More accurate weather forecasting depends on improved satellite data assimilation

The National Requirement: The Nation has a continual need for more accurate weather forecasts that extend further into the future. Improvements directly affect the ability of our populace to prepare for severe weather, allowing protective actions to be taken to reduce the affect of hurricanes, tornadoes, floods, etc. on people and commerce. More accurate forecasts depend largely on being able to use all the observations being taken.

NOAA's Response: Improved data and better use of this data in National Weather Service weather prediction models can make substantial improvements in weather forecasting. In the next few years, the number and quality of satellite instruments will grow significantly, providing enhanced data capable of allowing major improvements in weather prediction accuracy. NOAA, together with NASA, recently established the Joint Center for Satellite Data Assimilation (JCSDA) to facilitate the use of this data by developing new and powerful mathematical techniques to assimilate the data into numerical weather prediction (NWP) models. The prime benefit of the JCSDA will be improved weather forecasts and warnings, resulting in reduced losses of life and property, and an extension of the time range of weather and climate forecasts. NOAA will also realize productivity increases by reducing the average time for operational implementation of data from new satellite technology from two years to one year. With average satellite lifetimes of five years, this represents a 20 percent productivity increase per satellite.

In data assimilation, conditions computed by the NWP models are compared to the data directly observed by the satellite. When they differ, model conditions are modified to match the observations and the computations are repeated. These modifications use powerful mathematical analysis procedures that make the model more accurately represent the atmosphere, and provide enhanced predictions.

The early impact of satellite-measured variables on forecast accuracy was greatest in the Southern Hemisphere where there are fewer conventional weather observations and weather stations. Satellites filled the Southern Hemisphere data void and immediately improved the forecasts in this region. The largest improvement in Northern Hemisphere weather forecasting accuracy occurred when weather forecasters began the direct assimilation of satellite infrared sounder data into the global model. Direct assimilation of satellite microwave data, which took place within a year of the NOAA-15 launch in 1998 also had a major impact on the forecast accuracy.

Financing: The FY 2003 Budget includes \$3.3 million for the Joint Center for Satellite Data Assimilation (JCSDA) within the Product Development, Readiness, and Application request, an increase of \$2.6 million over the FY 2002 funding level. This funding will allow NOAA to develop new methods to use AIRS data over land areas, where differences in land features such as mountains, forests, deserts, and soil moisture make these measurements more difficult to assimilate in weather forecast models.